

From the Chair

The pre-AGU crunch is now in full bloom, but it is time to pause and look back over the past year, my first serving as Chair of the IRIS Board of Directors. I've had varying levels of involvement with IRIS since its inception, but nothing compares to the immersion that accompanies being Chair. From that unique vantage, I have gained an even deeper level of respect and admiration for the IRIS community, ranging from the staff to technicians to program managers and top administration, along with the many volunteer participants from the community. In helping to prepare the 5th IRIS 5-year proposal, I witnessed the sustained creativity and dedication of the full span of IRIS participants. We should all recognize the special nature of this collective enterprise, which is admired by many scientific communities and has gained increasing national and international attention. IRIS' response to large earthquakes, contributions to nuclear testing treaty monitoring, advocating of open-data policies, and enabling of a breathtaking range of exciting science applications using its facilities have all been amply demonstrated this year. In undertaking the USArray project on behalf of EarthScope, IRIS has rapidly added equipment, facilities, personnel and capabilities, the research impact of which is only beginning to emerge. Exciting times lie ahead for seismology and geophysics!

At the same time, there are many challenges and issues that IRIS participants must be aware of and attentive to. Federal budgets are severely stressed by costs of the war in Iraq and the losses from hurricanes and other natural disasters. NSF is not on the budget-doubling trajectory envisioned when the EarthScope MRE was developed, and many big science programs in the country are competing for diminished resources.

There can be no sense of entitlement or unlimited ambition for IRIS programs; the competition for alternate uses of NSF funds is ongoing and increasing. Long-term operation of the USArray facility, as it sweeps across the country and then heads to Alaska is a very expensive undertaking as well, and will further pressure NSF resources for Earth Sciences. Sustaining IRIS facilities is an expensive investment for NSF, which must be justified by the research contributions of the seismological community. I look forward, with your help, to improving documentation of the impact of IRIS facilities on our science.

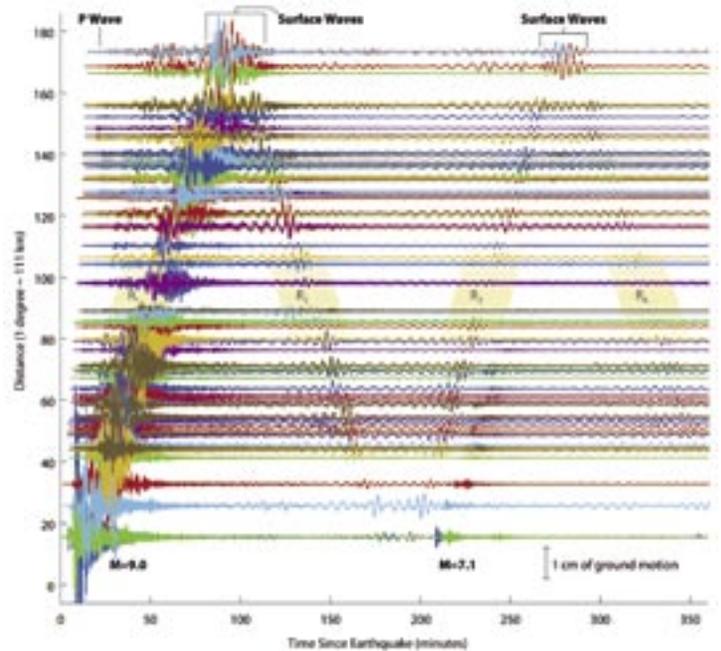
Thorne Lay

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Sumatra-Andaman Islands Earthquake (Mw=9.0)
 Global Displacement Wavefield from the GSN



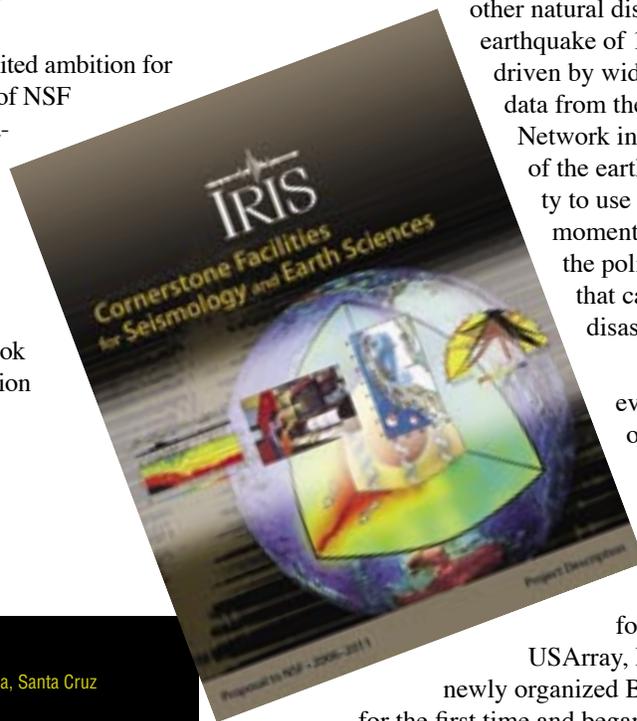
The Year in Review

At the start of 2005, the attention of the world was focused to an unprecedented degree on earthquake-caused hazards. The tragedy of the great earthquake in Sumatra and the ensuing tsunami was still unfolding towards a death toll greater than any other natural disaster since the Tangshan earthquake of 1976. IRIS activities were driven by widespread the role of open data from the Global Seismographic Network in rapidly assessing the size of the earthquake and a responsibility to use an exceptional "teachable moment" to increase awareness of the political and individual steps that can mitigate earthquake disasters.

But Sumatra-related events were far from the only activities of IRIS during those busy months. The proposal for EarthScope O&M was completed, laying out detailed plans

for long-term operation of USArray, PBO and SAFOD. The newly organized Board of Directors met for the first time and began tackling its corporate and science guidance responsibilities. On top of all this, the Board and the Planning Committee began preparing a proposal for a new 5-year cooperative agreement with NSF.

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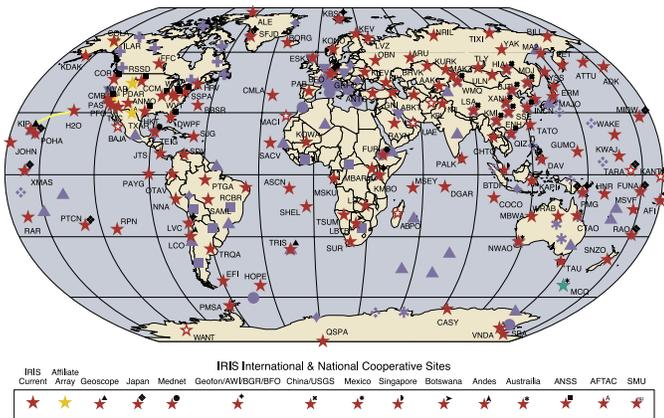


Global Seismographic Network

Program for the Array Seismic Studies of the Continental Lithosphere

The Global Seismographic Network is a permanent network of state of the art seismological and geophysical sensors connected by available telecommunications to serve the scientific research and monitoring requirements of our national and international community. All GSN data are freely and openly available to anyone via the Internet. Installed to provide broad, uniform global coverage of Earth, 138 GSN stations are now sited from the South Pole to Siberia and from the Amazon basin to islands in the Indian Ocean, in cooperation with over 100 host organizations and seismic networks in 59 countries worldwide. The GSN coordinates closely with other international Networks through the international Federation of Digital Seismograph Networks (FDSN), of which the IRIS is a founding member. The GSN is operated and maintained through the USGS Albuquerque Seismological Laboratory (ASL) and through the University of California at San Diego IRIS/IDA group.

Global Seismographic Network
& Federation of Broadband Digital Seismic Networks



GSN stations with:	
broadband seismometer	138
high-frequency seismometer	132
strong-motion sensor	93
borehole sensor	44
microbarograph	43
real-time communications	125
GSN stations serving as IMS auxiliary stations	23
Installed during 2005:	
new stations (MCQ, Australia affiliate)	1
new or upgraded communications	11

The PASSCAL program supports portable array seismology worldwide with end-to-end experiment support services, state-of-the-art portable seismic instrumentation, and advanced field and database management tools. This year PASSCAL took delivery of the first of the new generation "Texans", single channel recorders designed for active source experiments. The



new Texans have four times as much memory, allowing higher sample rates, longer recording times, and more shots per deployment. Yet they can be redeployed more quickly than the old Texans thanks to an even greater increase in data upload speed. New data loggers for passive experiments introduced during 2004 have proven more reliable than the older units, in addition to being lighter and providing IP connectivity. Experiment support has been enhanced through development of

new software for in-the-field "quick-look" and troubleshooting software. Over its history, PASSCAL has supported more than 500 deployments to image plate boundaries, cratons, orogenic systems, rifts, faults, and magmatic systems. PASSCAL plays an essential role in a variety of environmental research, including volcanic system imaging, fault-zone studies, basin-related seismic hazard, and hydrologic studies.

Number of experiments during 2005	>64
broadband	28
short period	11
"Texan"	13
multi-channel	12
Data Logger Inventory	
3-channel Data Loggers	600
RefTek RT125 (Texan)	869
Multi-channel	4
Sensor Inventory	
Broadband	434
Guralp 40T	94
Short period	171
High frequency	396

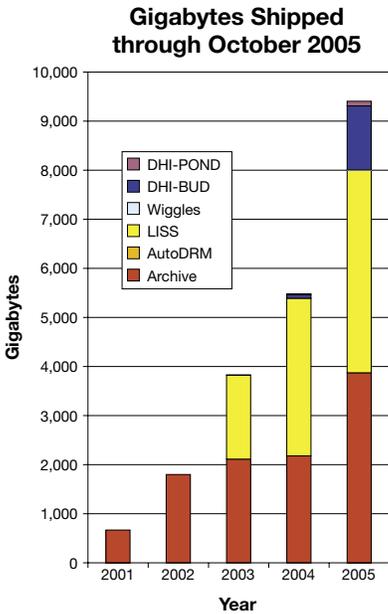
GSN Standing Committee

Jeffrey Park (Chair)	Yale University
Charles Ammon	Pennsylvania State University
Robert Detrick	Woods Hole Oceanographic Institute
Paul Earle	NEIC, USGS, Golden
Ed Garnero	Arizona State University
William Leith	USGS, Reston
Mike Ritzwoller	University of Colorado
Xiaodong Song	University of Illinois, Urbana
Jeroen Tromp	California Institute of Technology
Lianxing Wen	State Univ of New York, Stony Brook

PASSCAL Standing Committee

David James (chair)	Carnegie Institution of Washington
John Collins	Woods Hole Oceanographic Institution
Matthew Fouch	Arizona State University
John Hole	Virginia Tech
Camella Knapp	University of South Carolina
Stephane Rondenay	Massachusetts Institute of Technology
William Stephenson	USGS, Golden
William Walter	Lawrence Livermore National Lab
Colin Zelt	Rice University

The Data Management System receives, provides quality assurance, archives and distributes data from the GSN and PASSCAL programs, the USGS ANSS backbone and USGS



and NOAA supported regional networks, EarthScope/USArray, networks of the FDSN and other sources. The heart of the DMS is the Data Management Center in Seattle, WA, with the largest seismological data collection in the world. GSN data reach the DMC via real-time telemetry to collection centers at UCSD's IDA facilities and the USGS's Albuquerque Seismological Laboratory. Principal Investigators and New Mexico Tech staff at the PASSCAL Instrument Center review PASS-

CAL data before they are made available from the DMC. The DMC also performs automated quality control on most real time data. Data Handling Interface servers, which are already installed at the DMC, ORFEUS in the Netherlands, NCEDC at Berkeley and SCEDC at USC, will enable user applications to interact directly with distributed waveform server databases while performing analyses or integrating seismic and other types of data.

Data Archived	Tbytes
PASSCAL	12.1
GSN	9.0
FDSN	3.1
US Regional	13.5
Other	1.8
Data Requests Handled	
Customized	135,824
WILBER FARM	23,623
WILBER SPYDER®	12,173
WEED or jWEED	4,848
Assembled	79
Data Shipped	
Volume	11.0 Tbytes
Seismograms	540 million

The Education and Outreach (E&O) program is committed to using seismology and the unique resources of the IRIS Consortium to make significant and lasting contributions to science education, science literacy and the general public's understanding of the Earth. The E&O program has continued its development and dissemination of a well-rounded suite of educational activities designed to impact a spectrum of learners, ranging from 5th grade students to adults. These learning experiences transpire in a variety of educational settings ranging from self-exploration in front of one's own computer, to the excitement and awe of an interactive museum exhibit hall, a major public lecture, or in-depth exploration of the Earth's interior in a formal classroom.



New Educational Affiliates	4
Undergraduate summer interns	9
IRIS/SSA Distinguished Lectures	16
Teacher and student workshops using IRIS materials	26
Teachers and college faculty attending IRIS workshops	132
Total AS1 seismographs in schools	110
Posters distributed	22,000
Students taught by IRIS-trained teachers	45,000
IRIS Web site visits, unique monthly visitors	1,800,000
Visitors to museums with IRIS/USGS displays	15,000,000

DMS Standing Committee

Guust Nolet (Chair)	Princeton University
Emily Brodsky	University of California, Los Angeles
Megan Flannigan	Lawrence Livermore National Labs
Keith Koper	St Louis University
Daniel McNamara	USGS, Golden
Anne Trehu	Oregon State University
Suzan van der Lee	Northwestern University
Douglas Wiens	Washington University, St Louis

E&O Standing Committee

Richard Aster (Chair)	New Mexico Tech
Kathy Ellins	University of Texas, Austin
Susan Eriksson	UNAVCO
Alan Kafka	Boston College
Steve Semken	Arizona State University
Catherine Snelson	University of Nevada, Las Vegas
Seth Stein	Northwestern University
Aaron Velasco	University of Texas, El Paso
Lisa Wald	USGS, Golden

This year saw the completion of the second of five years of the EarthScope MRE project, and IRIS carried out a wide variety of tasks for EarthScope's USArray component. Over half of the Backbone Network is operating in its planned configuration, adding stations and capabilities to the USGS Advanced National Seismic System (ANSS). Transportable Array stations are in operation throughout California and in the Cascades Range in Washington and Oregon. Siting is underway for stations in Nevada and Arizona. TA data are collected and quality-controlled at UCSD's Array Network Facility, then archived at the DMC. TA site selection has included an outreach component, with graduate students carrying out reconnaissance in some areas and high schools hooking into live data feeds from the local TA station. To operate USArray's Array Operations Facility, IRIS occupied a new building constructed by New Mexico Tech that adjoins the PASSCAL Instrument Center, hired staff, and began taking receipt of instruments for the Flexible Array pool. Flexible Array experiments have started in Nevada and Washington. Preliminary site surveys



for the magnetotelluric backbone stations were carried out and prototype instruments were ordered after field testing. Daily updates on the status of USArray and other EarthScope facilities are provided on the EarthScope home page (www.EarthScope.org). Data from any part of USArray are available from the DMC with "virtual network codes" such as `_US-ALL`.

Transportable Array stations:	
Adopted from regional networks	61
Installed by USArray	59
Flexible Array systems:	
Broadband	80
Short period	80
"Texans"	700
Backbone Network stations:	
Operating	21

USArray Advisory Committee

- | | |
|-------------------------|------------------------------------|
| Adam Dziewonski (Chair) | Harvard University |
| Michael Bostock | University of British Columbia |
| Michael Gurnis | California Institute of Technology |
| Rainer Kind | GFZ Potsdam |
| James Knapp | University of South Carolina |
| Terry Plank | Boston University |
| George Thompson | Stanford University |

The Year in Review (continued from front page)

A PASSCAL strategic planning workshop in February was an opportunity to rethink the program's goals and the activities needed to reach them. The workshop endorsed evolution of PASSCAL from a lending library of seismic instruments to a set of services supporting all phases of geophysical experiments, and laid out a vision for services required to advance Earth science.

The E&O program took an important step forward with the first meeting of the E&O Affiliates, which defined itself as a community looking to establish collaborations with all IRIS members.

IRIS occupied the USArray Operating Facility, a new building constructed by New Mexico Tech that adjoins the PASSCAL Instrument Center, hired new staff, and ordered and took receipt of many instruments for the Flexible Array.

The monitoring role of the GSN gained further prominence with growth of GEOSS, a high-priority initiative seeking societal benefits from Earth observations. The GSN is a leader in dealing with the challenges inherent in building and operating a global network of "in-situ" observatories, which are now recognized as an essential complement to satellites.

The Standing Committees and the Annual Workshop were, in part, forums for deliberation on the IRIS proposal to NSF. "Cornerstone Facilities for Seismology and Earth Science" identifies Multidisciplinary Integration, Incorporating R&D in Core Operations, and Leveraging Partnerships in the Poles, Oceans, and Internationally as themes for the next five years. With more than synopses of projects that were facilitated by IRIS, the proposal has received generally excellent evaluations from NSF reviewers and panels.

IRIS is pushing ahead with activities related to the proposal themes, including plans to develop robust instrumentation for Antarctica jointly with UNAVCO, increasing the number and role of International Affiliates, and improving the cross-program activities of IRIS, such as supporting AfricaArray through long-term loans of reconditioned instruments and provision of data management services. These advances are typical of IRIS's more than 20-year history, which shows that leading development in promising areas depends foremost on broad community participation in all of IRIS's affairs.

IRIS Workshop June 8 – 10, 2006

The 18th Annual IRIS Workshop will be held at the Westward Look Resort near Tucson, AZ. Program chairs Karen Fischer and Susan Beck are planning sessions on international activities, as well as sessions on USArray organized by Gene Humphreys and Thorne Lay.

Planning Committee

- | | |
|------------------------|--------------------------------------|
| Art Lerner-Lam (Chair) | Columbia University |
| Goran Ekstrom | Harvard University |
| Thorne Lay | University of California, Santa Cruz |
| Alan Levander | Rice University |
| Anne Meltzer | Lehigh University |
| Barbara Romanowicz | University of California, Berkeley |
| David Simpson | IRIS |
| Ray Willemann | IRIS |
| Michael Wysession | Washington University |